

Stem cell therapy for cartilage regeneration in osteoarthritis. Koelling S1, Miosge N.
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Abstract

Enhancing the regeneration potential of hyaline cartilage tissue remains a great challenge. During embryonic development, some of the cells of the inner cell mass will turn into the mesoderm. This will be the founder of the mesenchymal cells in connective tissues of adult life, such as bone, tendon, muscle, and cartilage. Some of these embryonic mesenchymal cells are believed not to differentiate, but reside in each of the tissues. These are now collectively described as adult mesenchymal stem cells, which are thought to be capable of repairing injured tissue. We will briefly summarize the current knowledge about stem cell-related cells in cartilage tissue and carefully discuss the potential of the cell population we described recently as a starting-point for a regenerative therapy for osteoarthritis. We found that repair tissue from human articular cartilage during the late stages of osteoarthritis harbors a unique progenitor cell population, termed chondrogenic progenitor cells (CPC). These exhibit stem cell characteristics combined with a high chondrogenic potential. They offer new insights into the biology of progenitor cells and may be relevant in the development of novel therapeutic approaches for a cell-based therapy for late stages of osteoarthritis.